Note: This plan is a draft; the project goals and objects have not changed, but some of the Methods may have changed October 24, 2000

Assessment Plan for Net-pen Reared River Specific Releases; Lower River Movements

Draft Plan - June 22, 2000

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Project Goal:

The goal of this study is to compare lower river movement patterns of freshwater reared pre-spawning Atlantic salmon (captive broodstock released in previous years) versus marine reared pre-spawning Atlantic salmon within the East Machias and Machias Rivers.

Specific Objectives:

Release 16 ultrasonically tagged, netpen-reared, pre-spawning, Atlantic salmon adults (East Machias and Machias origin, 16 individuals from each stock, approximate 50:50 sex ratio) into the lower reaches of the East Machias and Machias drainages. We will passively track their movements with previously deployed Automatic Pinger Detection Units (APDU) at specified locations to qualify lower river movement patterns and actively track them with a VR60 Mobile Pinger Detection Unit to identify the location and disposition of any individuals not exhibiting typical Atlantic salmon spawning migration patterns.

Period:

September 2000 November 2000

Project Cooperators:

Atlantic Salmon of Maine, Inc. (ASOM), Connors Brothers Aquaculture, Inc. (CBA), Stolt Sea Farm (SSF), Maine Atlantic Salmon Commission (ASC), Northeast Fisheries Science Center (NEFSC), and US Fish & Wildlife Service (USF&WS).

Background:

In February 1997, approximately 60,000 eyed eggs from river specific Atlantic salmon broodstock of the Dennys (20,000), Machias (20,000), and East Machias (20,000) Rivers were transferred from Craig Brook National Fish Hatchery to private aquaculture facilities for rearing. Eggs from the Machias River were reared at the Oquossoc Hatchery in Rangely, Maine, while those from the Dennys and East Machias Rivers were reared at the Solon Hatchery in Skowhegan, Maine. A Memorandum of Understanding signed by the U.S. Fish and Wildlife Service, state of Maine natural resource agencies, and Atlantic Salmon of Maine, Inc., outlined the transfer of these eggs and described the need for an evaluation of this trial program. These investigations are the final component to the ongoing efforts to evaluate this program and are designed to determine the contributions these adults will make to the future spawning stocks.

The transfer of eggs from the Federal Hatchery System to private aquaculture is part of Maine s Conservation Plan. The purpose of this joint venture is to involve the aquaculture industry in the rehabilitation of native stocks using their facilities and expertise. The planned products of these transfers were 1) juvenile fish and 2) mature Atlantic salmon.

Juvenile Atlantic salmon were stocked out as advanced parr or smolts (age 1+). Approximately 34,000 smolt/parr were released into their respective rivers during the spring of 1998 (Dennys River (9,800), Machias River (10,900), and East Machias (14,100)). In addition, approximately 2,000 smolts from each stock were divided into two lots and transferred to separate marine netpen facilities at Cross Island, Machias Bay (ASOM) and Deep Cove, Cobscook Bay (CB) during May 1998. All of these, approximately 6,000 smolts, were triple marked: adipose fin clip, and a colored Visual Implant Elastomer (VIE) tag applied to both the right adipose eye tissue, and to the right lower jaw. Each river has been designated a uniquely colored VIE tag (Dennys - orange, East Machias - yellow, and Machias - red) to aid in future stock differentiation.

These netpen reared individuals will have experienced two full sea winters and will be approaching the spawning age typical of Maine Atlantic salmon during the fall of 2000. At this point they offer a unique management opportunity whereby for the first time ever, mature marine-reared Atlantic salmon adults can be stocked into their respective rivers. These fish have not spent any time within the waters of their respective drainages and therefore have not experienced any of the currently accepted cues that would dictate homing to their natal drainages during the spawning season. **Information on the fidelity of marine reared spawning stocks is essential to the successful utilization of this technique as a management tool to be used for the development of self-sustaining river specific populations of Atlantic salmon.**

During fall 1998, 16 freshwater-reared broodstock (16 East Machias and 16 Machias, 50:50 sex ratio) were tagged with V16 ultrasonic pingers and released at 2 different sites within the lower

reaches of the East Machias and Machias Rivers. VR20 Automatic Pinger Detection Units (APDU) were deployed throughout the lower reaches of the two drainages (4 units per drainage). In addition, one unit was placed within the marine environment, well below the confluence of the two drainages. The tagged fish were released on 10 October 1998 and were passively tracked through to 11 November 1998.

Our plan is to duplicate the 1998 efforts with the marine-reared adults available from the Cross Island facility. Movement patterns from the 1998 freshwater-reared adults and the 2000 marine-reared adults can then be compared and the effectiveness of lower river releases for each group can be determined. Movement patterns between drainages will also be compared.

Materials and Methods:

Tracking Phase:

Lower East Machias and Machias Drainages

I. Deploy 10 programmed VR20 APDU at the specified locations (see **Table 1**) just prior to adult stocking (October xx, 2000)

a. Deploy according to standard protocols using canoe or the USFWS s R/V Tin Can

Table 1: Deployment locations for 10 APDU throughout the lower reaches of the East Machias and Machias Drainages.

	Unit name	Alt name	Locale
1.	Smolt trap site	IFW	Machias
2.	Downtown	Mac1	Machias
3.	Near Libby Brook	Libby	Machias
4.	Jacksonville bridges	Jack	East Machias
5.	Chase Mill Stream mouth	Chase	East Machias
6.	Above Gaddis pool	Gaddis	East Machias
7.	Rim Road-Rte 1 jct.	Up Rim	East Machias
8.	Simpson's wharf	Rim	East Machias
9.	Machiasport	Port	Machias Bay
10.	Middle*	Middle	Middle River

** New for 2000 array. Added to evaluate in any Machias individuals deterred by the Machias gorge entered the Middle River.*

II. Active tracking will be conducted according to standard protocols in an opportunistic fashion while APDU are deployed

III. Retrieve all VR20 APDU for data downloading according to standard protocols (October xx, 2000 + 6 weeks)

Stocking Phase:

Freshwater Acclimation facility (University of Maine Franklin facility)

I. Isolate 16 East Machias and 16 Machias mature individuals (50:50 sex ratio will be approximated)

II. Biological sampling of stocked individuals

- **a.** Lengths, weights, scales, genetics
- **b.** Passive induced transponder tag (PIT) - All individuals
  - **i.** Stocking location will be recorded by PIT tag codes
- **c.** V16 ultrasonic tag gastric insertion All individuals

III. Transfer of individuals to specific stocking sites located within the respective drainages for stocking (according to **Table 2**) (October xx, 2000)

Table 2. Stocking sites for lower river movement patterns evaluation.

Stock	Release site	Number
East Machias	Rim Road*	16
Machias	Behind Machias Irving Station*	16

** Same as 1998 release sites*

Table 3. Study projected timeline.

September 2000	October 2000	November 2000	
Wk1	Wk2	Wk3	Wk4Wk1Wk2Wk3Wk4Wk1Wk2Wk3Wk4
	X		Pre-deployment setup of APDU
		X	Adult transfer to freshwater facility
			XBiological sampling of adults (gastric pinger insertion)
			XAPDU deployment
			XAdult release
			XXXXXXX Active Tracking with VR60
			XAPDU retrieval and downloading